Trend Study 2-25-01

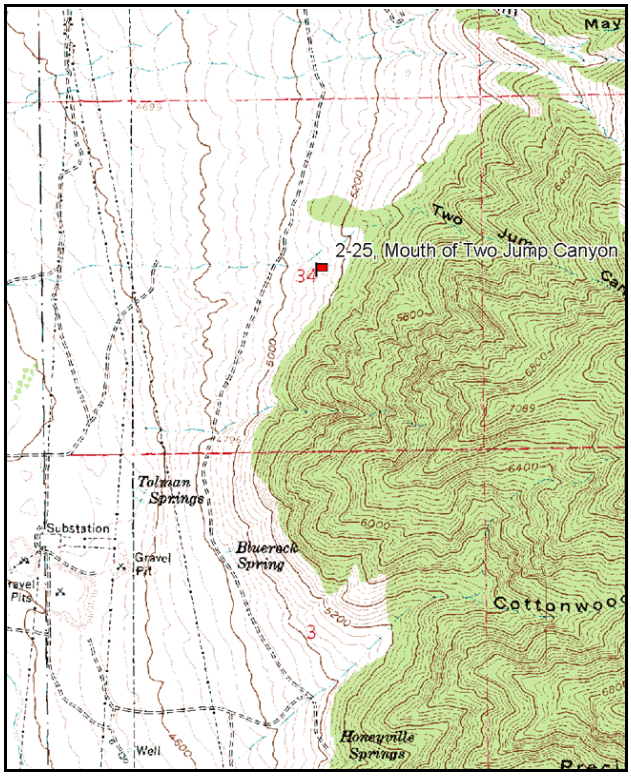
Study site name: Mouth of Two Jump Canyon. Vegetation type: Big Sagebrush.

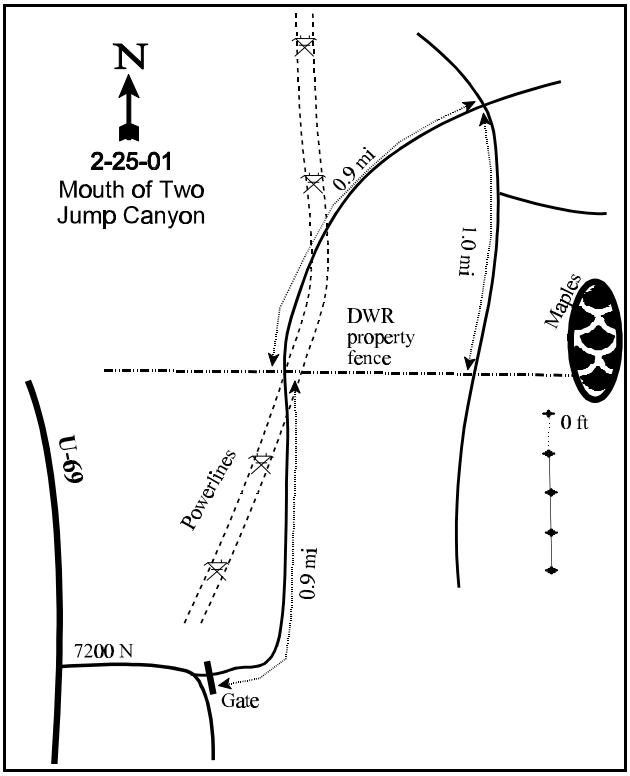
Compass bearing: frequency baseline 165 degrees magnetic.

Frequency belt placement: line 1 (11 & 71ft), line 2 (34ft), line 3 (59ft), line 4 (95ft).

LOCATION DESCRIPTION

From the junction of 7200 North and U-69 in Honeyville, proceed east and north for 0.55 miles to a gate. Proceed 0.9 miles to the north to a fence. Continue another 0.9 miles and turn right (south) and travel 1.0 mile to a fence running east and west. Walk east along the fence (approximately 200 yards) past one maple stand, and stopping at the second which the fence passes through. From where the fence enters the maples walk 16 paces at 244 degrees magnetic to the 0-foot stake of the baseline marked with browse tag #7923.





Map Name: Honeyville

Diagrammatic Sketch

Township 11N, Range 2W, Section 34

UTM 4611016 N, 412202 E

DISCUSSION

Trend Study No. 2-25

The Mouth of Two Jump Canyon trend study samples one of the better mountain big sagebrush types in the unit. Located just south of Two Jump Canyon, the site slopes steeply (30%) to the west at 5,060 feet in elevation. The area received heavy winter use by deer in 1984 and 1990. Use was lighter in 1996 with pellet group quadrat frequency low at only 7% for deer. A pellet group transect read at the site in 2001 estimated 45 deer days use/acre (111 ddu/ha). The deer pellet groups appeared to be primarily from winter use. Cattle also utilize the area, but were not present at the time of study establishment in 1984. Cattle use was estimated at 3 cow days use/acre (7 cdu/ha) in 2001.

Soil is classified as "Sterling Gravelly Loam" (Chadwick et al. 1975) similar to that of the Calls Fort Canyon study (2-24). However, this area is less rocky and not nearly so eroded or depleted of perennial cover as Calls Fort Canyon. Overall soil condition is better and potential rooting depth appears greater. Effective rooting depth (see methods) was estimated at nearly 15 inches. The soil is extremely rocky throughout the profile with a strong calcareous layer at a depth of 6 to 8 inches. Parent material is limestone. Soil texture is a loam with a soil reaction that is moderately alkaline (pH of 7.9). Average soil temperature is high at 73° F at 15 inches in depth. Vegetation and litter cover are abundant and well dispersed effectively limiting erosion. The erosion condition class was determined to be stable in 2001.

Browse composition consists of a dominant population of mountain big sagebrush in association with a less conspicuous but more numerous population of broom snakeweed. Mountain big sagebrush had a population of 2,065 plants/acre in 1984. Seventy-one percent were categorized as large mature plants averaging 3½ feet in height. Most of these shrubs (77%) were heavily utilized, yet vigor was generally good. During the 1990 reading, utilization was mostly moderate with poor vigor classified on nearly half of the population (45%). Percent decadence rose from 26% to 73%, while 44% of the decadent shrubs appeared to be dying. Recruitment was poor with few seedling and young plants sampled. During the 1996 reading, population density increased to 1,860 plants/acre, and there were equal numbers of mature and decadent plants (760 plants/acre). Utilization was light to moderate. Some of the decadent plants sampled from 1990 appeared to have regained their vigor and were now healthy mature plants. Dead plants, first sampled in 1996, numbered 960 plants/acre. Recruitment improved with 200 seedling and 340 young plants/acre estimated. Density has declined slightly in 2001 to 1,460 plants/acre. Utilization is mostly light, but vigor is poor on 21% of the plants sampled with over half (52%) classified as decadent. In addition, 40% (300 plants/acre) of the decadent plants were classified as dying. Reproduction is good however, with 15% of the population consisting of young plants.

The most numerous shrub on the site is broom snakeweed which had an estimated density of 5,580 plants/acre in 1996. Age class analysis indicated an expanding population with a biotic potential (percent of seedlings to total density) of 68% with 25% classified as young plants. During the 2001 reading, density of broom snakeweed increased by 25% to 7,460 plants/acre. Most of the plants are mature (88%) indicating a stable population. A few other shrub species occur rarely in clumps or patches. They include blueberry elder, Rocky Mountain maple, Rocky Mountain smooth sumac, and a few Utah junipers.

The annual grasses, rattlesnake brome, Japanese brome, and cheatgrass dominate the herbaceous understory. They combined to produce nearly 30% cover in 1996, which accounted for 77% of the grass cover. Cover and sum of nested frequency for annual grasses declined in 2001, although they still account for 66% of the grass cover. Perennial grasses are represented by moderate amounts of bluebunch wheatgrass and Sandberg bluegrass. Forbs are diverse and contain some desirable species that include arrowleaf balsamroot, paintbrush, Utah sweetvetch, lomatium, and sulfur eriogonum.

1984 APPARENT TREND ASSESSMENT

Soil at the site appears to be stable. Some erosion is apparent, yet is being controlled by a moderately good herbaceous cover. Erosion pavement and rock are important cover categories that tend to armor the soil surface. Vegetative trend is mainly characterized by an apparently stable big sagebrush population. Apart from big sagebrush, the most sensitive parameters to monitor in the future would be the composition of the herbaceous understory which contains several weeds.

1990 TREND ASSESSMENT

This study samples an area of suitable winter range, with an adequate amount of browse forage production. The mountain big sagebrush plants on the site are generally moderately hedged and have fair vigor. Seventy-three percent of the population was classified as decadent, and sagebrush decreased in density. Snakeweed is abundant in the understory with it's density increasing 3-fold. The browse trend is considered down. Trend for the herbaceous understory is up with an increase in the sum of nested frequency of perennial grasses and forbs. Considering the shallow, rocky soil, sheet erosion is normal with generally adequate vegetative and litter cover.

TREND ASSESSMENT
soil - stable but poor condition (3)
browse - downward (1)
herbaceous understory - up (5)

1996 TREND ASSESSMENT

Trend for soil is up slightly with an increase in litter cover and a decline in percent bare ground from 7% to less than 1%. This improved soil protection comes primarily from cheatgrass which provides nearly half of the herbaceous cover (46%). Trend for the key browse, mountain big sagebrush, is up slightly. Utilization is lighter, vigor is improved, and percent decadency decreased from 73% to 41%. Total density has increased slightly and recruitment has improved. The high proportion of dead plants coupled with the decline in decadency suggests that the sagebrush population is in a process of changing from an old, over mature population to a younger more vigorous stand. If reproduction remains good in the future and utilization remains light to moderate, the sagebrush stand will be able to maintain itself. One negative aspect of the browse trend is the abundance and dynamic reproductive potential of broom snakeweed. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses increased slightly while that of forbs declined a little.

TREND ASSESSMENT
soil - up slightly (4)
browse - up slightly (4)
herbaceous understory - stable (3)

2001 TREND ASSESSMENT

Trend for soil is stable. There is abundant vegetation and litter cover, which combined with rock and pavement cover, leaves very little unprotected bare ground (<1%). Consequently, there is little erosion occurring. Trend for the key browse species, mountain big sagebrush, is down slightly and appears to be suffering the effects of drought. Density has declined slightly while utilization is mostly light. Percent decadence has increased from 41% to 52%. Forty percent of the decadent plants sampled were classified as dying. Reproduction is still good with 15% of the population consisting of young plants. Seedlings are also moderately abundant. Drought conditions also appear to be effecting the broom snakeweed population. It's density has increased 25% since 1996 to 7,460 plants/acre, but 16% of the plants sampled are chlorotic or have partial crown death. The population is now mostly mature. Trend for the herbaceous understory is up due to an increase in the sum of nested frequency for perennial grasses and forbs. In addition, nested frequency of cheatgrass and rattlesnake brome declined significantly. The forb composition has remained unchanged. The dominant forb is still arrowleaf balsamroot which has had stable nested frequency values. Annual forbs increased substantially in sum of nested frequency. The largest increase occurred in pale alyssum.

TREND ASSESSMENT
soil - stable (3)
browse - down slightly (2)
herbaceous understory - up (5)

HERBACEOUS TRENDS --
Herd unit 02 , Study no: 25

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
G	Agropyron spicatum	43	65	39	43	19	29	17	18	3.73	2.10
G	Bromus brizaeformis (a)	-	-	b267	a174	-	-	87	66	4.28	1.18
G	Bromus japonicus (a)	-	-	67	72	-	-	26	29	1.12	.83
G	Bromus tectorum (a)	-	-	b373	a334	-	-	100	95	20.85	15.16
G	Festuca myuros (a)	-	-	b47	a-	-	-	16	-	1.13	-
G	Koeleria cristata	-	-	5	6	-	-	3	2	.09	.15
G	Poa bulbosa	a-	a-	a6	b26	-	-	3	11	.04	.24
G	Poa secunda	a24	b100	b136	c208	16	49	54	77	4.36	6.32
Total for Annual Grasses		0	0	754	580	0	0	229	190	27.40	17.17
Total for Perennial Grasses		67	165	186	283	35	78	77	108	8.22	8.83
Total for Grasses		67	165	940	863	35	78	306	298	35.63	26.00
F	Achillea millefolium	12	16	11	8	5	6	4	3	.33	.06
F	Alyssum alyssoides (a)	-	-	a152	b260	-	-	66	89	1.00	1.56
F	Allium spp.	a-	a2	a7	b73	-	2	4	35	.07	.20
F	Ambrosia psilostachya	27	39	31	33	10	19	15	13	.62	.38
F	Apocynum androsaemifolium pumilum	a-	b10	a-	b15	-	8	-	7	-	.18

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
F	Arabis spp.	-	1	1	-	-	1	1	-	.00	-
F	Arenaria fendleri	-	-	-	2	-	-	-	1	-	.03
F	Artemisia ludoviciana	22	24	16	29	9	12	6	12	.52	.38
F	Astragalus spp.	1	-	5	3	1	-	3	1	.04	.03
F	Astragalus utahensis	-	-	5	6	-	-	2	3	.18	.45
F	Balsamorhiza sagittata	$_{a}$33	$_{b}$73	$_{b}$64	$_{b}$67	16	38	35	29	5.22	4.31
F	Castilleja linariaefolia	-	-	3	-	-	-	1	-	.03	-
F	Calochortus nuttallii	-	-	-	5	-	-	-	2	-	.01
F	Cirsium undulatum	-	1	1	4	-	1	1	2	.04	.06
F	Comandra pallida	-	2	6	6	-	2	3	3	.09	.04
F	Cryptantha spp.	-	5	3	3	-	3	1	1	.03	.00
F	Draba spp. (a)	-	-	$_{a}$-	$_{b}$48	-	-	-	19	-	.14
F	Epilobium brachycarpum (a)	-	-	1	3	-	-	1	1	.00	.00
F	Erodium cicutarium (a)	-	-	2	-	-	-	2	-	.06	-
F	Eriogonum umbellatum	$_{a}$5	$_{a}$6	$_{ab}$16	$_{b}$25	2	3	6	11	.40	.15
F	Gilia spp. (a)	-	-	-	4	-	-	-	1	-	.00
F	Hackelia patens	$_{a}$-	$_{b}$18	$_{ab}$11	$_{a}$3	-	8	6	1	.25	.00
F	Hedysarum boreale	$_{a}$-	$_{b}$12	$_{a}$-	$_{a}$1	-	6	-	1	.06	.15
F	Holosteum umbellatum (a)	-	-	$_{a}$17	$_{b}$113	-	-	7	40	.03	.22
F	Lactuca serriola	-	-	1	-	-	-	1	-	.00	-
F	Lithospermum ruderale	4	4	19	22	3	4	10	9	.64	.70
F	Lomatium grayi	$_{a}$-	$_{c}$64	$_{ab}$8	$_{b}$21	-	31	4	10	.07	.58
F	Machaeranthera canescens	-	-	-	2	-	-	-	1	-	.00
F	Machaeranthera grindelioides	-	-	-	2	-	-	-	1	-	.00
F	Microsteris gracilis (a)	-	-	-	12	-	-	-	8	-	.04
F	Penstemon spp.	$_{b}$7	$_{ab}$1	$_{a}$-	$_{ab}$3	5	1	-	1	.00	.00
F	Phacelia spp.	$_{c}$32	$_{ab}$3	$_{b}$7	$_{a}$-	17	2	5	-	.12	-
F	Phlox longifolia	-	6	2	4	-	3	1	2	.03	.06
F	Polygonum douglasii (a)	-	-	2	-	-	-	1	-	.00	-
F	Ranunculus testiculatus (a)	-	-	-	2	-	-	-	1	-	.00
F	Tragopogon dubius	$_{a}$1	$_{a}$7	$_{a}$7	$_{b}$34	1	3	4	18	.10	.49
Total for Annual Forbs		0	0	174	442	0	0	77	159	1.10	1.99
Total for Perennial Forbs		144	294	224	371	69	153	113	167	8.90	8.33
Total for Forbs		144	294	398	813	69	153	190	326	10.01	10.32

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 02 , Study no: 25

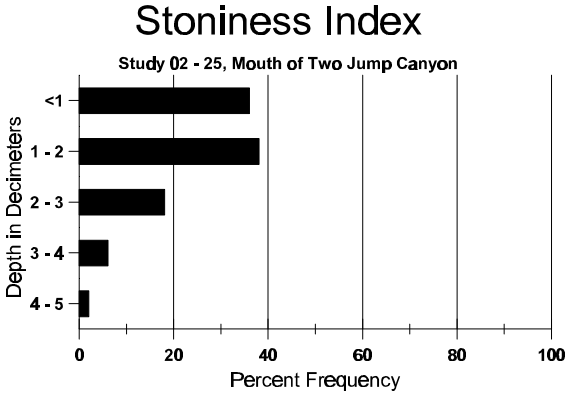
Type	Species	Strip Frequency '96	Strip Frequency '01	Average Cover % '96	Average Cover % '01
B	Artemisia tridentata vaseyana	63	55	12.42	7.53
B	Eriogonum microthecum	1	0	-	-
B	Gutierrezia sarothrae	75	83	3.33	4.02
B	Rhus glabra cismontana	0	0	1.37	-
Total for Browse		139	138	17.13	11.56

BASIC COVER --
Herd unit 02 , Study no: 25

Cover Type	Nested Frequency '96	Nested Frequency '01	Average Cover % '84	Average Cover % '90	Average Cover % '96	Average Cover % '01
Vegetation	387	378	1.50	7.00	56.31	56.03
Rock	210	185	18.00	16.75	14.04	12.02
Pavement	90	131	21.25	13.75	3.66	3.74
Litter	392	384	57.50	55.75	65.69	49.71
Cryptogams	68	51	.50	.25	.70	.48
Bare Ground	26	37	1.25	6.50	.44	.28

SOIL ANALYSIS DATA --
Herd Unit 02, Study no: 25, Mouth of Two Jump Canyon

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
14.8	73.4 (14.7)	7.9	43.4	33.4	23.3	3.5	13.3	70.4	.6



PELLET GROUP FREQUENCY --
Herd unit 02 , Study no: 25

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'96	'01	⁄01	⁄01
Rabbit	1	6	35	N/A
Elk	-	-	17	1 (3)
Deer	7	14	583	45 (111)
Cattle	2	-	35	3 (7)

BROWSE CHARACTERISTICS --
Herd unit 02 , Study no: 25

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	84	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	96	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10
	01	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
Y	84	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	96	14	3	-	-	-	-	-	-	-	17	-	-	-	340			17
	01	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
M	84	-	5	17	-	-	-	-	-	-	22	-	-	-	1466	42	43	22
	90	2	3	-	-	-	-	-	-	-	4	-	1	-	333	27	33	5
	96	27	10	1	-	-	-	-	-	-	36	-	1	1	760	27	41	38
	01	22	2	-	-	-	-	-	-	-	24	-	-	-	480	26	35	24
D	84	-	1	7	-	-	-	-	-	-	6	-	1	1	533			8
	90	5	6	5	-	-	-	-	-	-	7	-	2	7	1066			16
	96	18	17	1	2	-	-	-	-	-	25	1	-	12	760			38
	01	31	7	-	-	-	-	-	-	-	23	-	-	15	760			38
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	960			48
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	940			47

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	23%	77%	06%	-29%
'90	41%	23%	45%	+21%
'96	32%	02%	15%	-22%
'01	12%	00%	21%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	2065	Dec:	26%
	'90	1465		73%
	'96	1860		41%
	'01	1460		52%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum microthecum																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40	18	22	2
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	
'90	00%	00%	00%	
'96	00%	00%	00%	
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'84	0	Dec:		-
'90	0			-
'96	40			-
'01	0			-

Gutierrezia sarothrae																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	96	191	-	-	-	-	-	-	-	-	191	-	-	-	3820			191
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	80	-	-	-	-	-	-	-	-	80	-	-	-	5333			80
	96	67	-	-	2	-	-	-	-	-	69	-	-	-	1380			69
	01	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	84	46	-	-	-	-	-	-	-	-	46	-	-	-	3066	13	10	46
	90	56	-	-	2	-	-	-	-	-	58	-	-	-	3866	11	12	58
	96	210	-	-	-	-	-	-	-	-	210	-	-	-	4200	11	14	210
	01	329	-	-	-	-	-	-	-	-	278	-	51	-	6580	11	13	329
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	7	-	-	-	-	-	-	-	-	4	-	-	3	466			7
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	42	-	-	-	-	-	-	-	-	32	-	5	5	840			42
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	160			8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	+68%
'90	00%	00%	02%	-42%
'96	00%	00%	00%	+25%
'01	00%	00%	16%	

Total Plants/Acre (excluding Dead & Seedlings)				
'84	3066	Dec:		0%
'90	9665			5%
'96	5580			0%
'01	7460			11%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Rhus glabra cismontana																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	21	-	-	-	-	-	-	-	-	21	-	-	-	420			21
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	70	107	0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'84	00%	00%	00%
'90	00%	00%	00%
'96	00%	00%	00%
'01	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	0	Dec:	-
	'90	0		-
	'96	0		-
	'01	0		-